

C L A I M S

I Claim:

1. A method of buffering data within a first-in first-out buffer comprising:
 - a. receiving a stream of data to be buffered within the first-in first-out buffer;
 - b. storing the stream of data within the first-in first-out buffer thereby forming a stored stream of data;
 - c. obtaining a series of program instructions specifying operations to be performed on the stored stream of data; and
 - d. generating an output stream of data by executing the series of program instructions and performing the operations on the stored stream of data.
2. The method as claimed in claim 1 wherein the program instructions are obtained from an application.
3. The method as claimed in claim 1 wherein the program instructions are obtained from a control circuit.
4. The method as claimed in claim 1 wherein the stream of data is received from a bus structure.
5. The method as claimed in claim 4 wherein the bus structure is an IEEE 1394 bus structure.
6. The method as claimed in claim 1 further comprising transmitting the output stream of data from a buffer interface.
7. The method as claimed in claim 1 wherein generating an output stream includes synchronizing the output stream of data to a time reference.
8. The method as claimed in claim 7 wherein the time reference is a cycle time of an IEEE 1394 bus structure.

1 9. A method of buffering data within a first-in first-out buffer comprising:
2 a. receiving a stream of data to be buffered within the first-in first-out buffer;
3 b. storing the stream of data within the first-in first-out buffer thereby forming a
4 stored stream of data;
5 c. obtaining a series of program instructions specifying operations to be performed
6 in relation to the stored stream of data; and
7 d. generating an output stream of data by executing the series of program
8 instructions and performing the operations in relation to the stored stream of data,
9 including synchronizing the output stream of data to a time reference.

1 10. The method as claimed in claim 9 wherein the program instructions are obtained
2 from an application.

1 11. The method as claimed in claim 9 wherein the program instructions are obtained
2 from a control circuit.

1 12. The method as claimed in claim 9 wherein the stream of data is received from a
2 bus structure.

1 13. The method as claimed in claim 12 wherein the bus structure is an IEEE 1394 bus
2 structure.

1 14. The method as claimed in claim 9 further comprising transmitting the output
2 stream of data from a buffer interface.

1 15. The method as claimed in claim 9 wherein generating an output stream of data
2 includes manipulating the stored stream of data to form the output stream of data.

1 16. The method as claimed in claim 9 wherein the time reference is a cycle time of an
2 IEEE 1394 bus structure.

1 17. An apparatus for buffering data within a first-in first-out buffer comprising:
2 a. means for receiving a stream of data to be buffered within the first-in first-out

3 buffer;

4 b. means for storing the stream of data within the first-in first-out buffer thereby
5 forming a stored stream of data;

6 c. means for obtaining a series of program instructions specifying operations to be
7 performed on the stored stream of data; and

8 d. means for generating an output stream of data by executing the series of program
9 instructions and performing the operations on the stored stream of data.

1 18. The apparatus as claimed in claim 17 wherein the program instructions are
2 obtained from an application.

1 19. The apparatus as claimed in claim 17 wherein the program instructions are
2 obtained from a control circuit.

3 20. The apparatus as claimed in claim 17 wherein the means for receiving a stream of
4 data is coupled to a bus structure to receive the stream of data.

5 21. The apparatus as claimed in claim 20 wherein the bus structure is an IEEE 1394
6 bus structure.

7 22. The apparatus as claimed in claim 17 further comprising means for transmitting
8 coupled to the means for generating for transmitting the output stream of data.

9 23. The apparatus as claimed in claim 17 wherein the means for generating
1 synchronizes the output stream of data to a time reference.

2 24. The apparatus as claimed in claim 23 wherein the time reference is a cycle time of
3 an IEEE 1394 bus structure.

4 25. A programmable first-in first-out buffer comprising:

5 a. an input interface circuit configured to receive a stream of data to be buffered
6 within the first-in first-out buffer;

7 b. a data memory coupled to the input interface circuit to store the stream of data,

5 thereby forming a stored stream of data;

6 c. a program memory configured to obtain and store a series of program instructions
7 specifying operations to be performed on the stored stream of data; and

8 d. an execution unit coupled to the program memory and to the data memory to
9 generate an output stream of data by executing the series of program instructions
10 and perform the operations on the stored stream of data.

1 26. The programmable first-in first-out buffer as claimed in claim 25 wherein the
2 program instructions are obtained from an application.

1 27. The programmable first-in first-out buffer as claimed in claim 25 wherein the
2 program instructions are obtained from a control circuit.

1 28. The programmable first-in first-out buffer as claimed in claim 25 wherein the
2 input interface circuit is coupled to a bus structure to receive the stream of data.

1 29. The programmable first-in first-out buffer as claimed in claim 28 wherein the bus
2 structure is an IEEE 1394 bus structure.

1 30. The programmable first-in first-out buffer as claimed in claim 25 further
2 comprising an output interface circuit coupled to the execution circuit and the data memory and
3 configured to transmit the output stream of data.

1 31. The programmable first-in first-out buffer as claimed in claim 25 wherein the
2 execution unit synchronizes the output stream of data to a time reference.

1 32. The programmable first-in first-out buffer as claimed in claim 31 wherein the time
2 reference is a cycle time of an IEEE 1394 bus structure.

1 33. A system comprising:

2 a. a bus interface circuit configured to couple to a bus structure and receive a stream
3 of data;

4 b. a data memory coupled to the bus interface circuit to store the stream of data,

5 thereby forming a stored stream of data, wherein the data memory stores and
6 outputs the stored stream of data, thereby forming an output stream of data;

7 c. a program memory configured to obtain and store a series of program instructions
8 specifying operations to be performed on the stored stream of data; and

9 d. an execution unit coupled to the program memory and to the data memory to
10 generate the output stream of data by executing the series of program instructions
11 and performing the operations on the stored stream of data.

1 34. The system as claimed in claim 33 wherein the program instructions are obtained
2 from an application.

1 35. The system as claimed in claim 33 wherein the program instructions are obtained
2 from a control circuit.

3 36. The system as claimed in claim 33 wherein the bus structure is an IEEE 1394 bus
4 structure.

5 37. The system as claimed in claim 33 further comprising an output interface circuit
6 coupled to the execution unit and the data memory and configured to transmit the output stream
7 of data.

8 38. The system as claimed in claim 33 wherein the execution unit synchronizes the
9 output stream of data to a time reference.

1 39. The system as claimed in claim 38 wherein the time reference is a cycle time of an
2 IEEE 1394 bus structure.

3 40. A network of devices comprising:

4 a. a plurality of devices;

5 b. a bus structure coupled between the plurality of devices to transmit data between
6 the devices; and

7 c. a programmable first-in first-out buffer including:

8 i. an input interface circuit configured to receive a stream of data to be

buffered within the first-in first-out buffer;

ii. a data memory coupled to the input interface circuit to store the stream of data, thereby forming a stored stream of data;

iii. a program memory configured to obtain and store a series of program instructions specifying operations to be performed on the stored stream of data; and

iv. an execution unit coupled to the program memory and to the data memory to generate an output stream of data by executing the series of program instructions and perform the operations on the stored stream of data.

41. The network of devices as claimed in claim 40 wherein the program instructions are obtained from an application.

42. The network of devices as claimed in claim 40 wherein the program instructions are obtained from a control circuit.

43. The network of devices as claimed in claim 40 wherein the bus structure is an IEEE 1394 bus structure.

44. The network of devices as claimed in claim 40 further comprising an output interface circuit coupled to the execution unit and the data memory and configured to transmit the output stream of data.

45. The network of devices as claimed in claim 40 wherein the execution unit synchronizes the output stream of data to a time reference.

46. The network of devices as claimed in claim 45 wherein the time reference is a cycle time of an IEEE 1394 bus structure.